Faribault Energy Park, LLC

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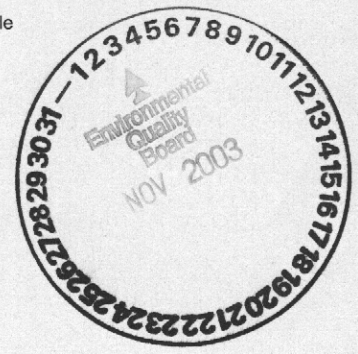

October 29, 2003

Bill Storm
Department of Administration
Environmental Quality Board
658 Cedar Street
Room 300
St. Paul, MN 55155

Dear Mr. Storm:

Subject: Response to Comments from the Minnesota Division of Health

On behalf of Faribault Energy Park, LLC, we have prepared additional information in response to the comments from the Minnesota Division of Health on the draft EIS scoping document. These comments focus on the air emissions from the combustion turbine given particular consideration to the type of fuel being used and the associated potential permitted emissions.

Emissions from Natural Gas and Fuel Oil Combustion

The combustion turbine will emit a variety of air pollutants. Of these pollutants, six are classified as *criteria pollutants*: Nitrogen Oxides (NO_X), Carbon Monoxide (CO), Volatile Organic Compounds (VOC), Particulate Matter and Particulate Matter less than 10 microns (PM/PM_{10}), Sulfur Dioxide (SO_2), and Lead (Pb). Another classification of air pollutants is *air toxics*. Air toxics include the six criteria pollutants previously identified as well remainder of other pollutants that may be of concern. Criteria pollutants that are emitted in significant quantities are subject to Federal Prevention of Significant Deterioration (PSD) Regulations. All of the criteria pollutants, except lead, are subject to PSD review on this project. The air toxics are subject to regulation under the State of Minnesota's Air Toxics Review Program.

The combustion turbine and the auxiliary boiler each will have the capacity to combust natural gas or low sulfur No. 2 fuel oil. The combustion of either fuel generates emissions of criteria pollutants. Both fuels also have the potential to emit air toxics, although different types of chemicals are emitted for each fuel type. Other emission sources such as the emergency generator and fire pump will use low sulfur fuel oil only and not natural gas. The type and quantity of emissions from each emission source are identified and quantified in the PSD Air Quality Permit Application submitted to the MPCA in June 2003. In general, the emissions from natural gas combustion are less than the emissions from fuel oil combustion.

Pollutants such as PM/PM_{10} and SO_2 are fuel derived, meaning that their emission rates correspond to the amount of contaminants found in the fuel. Contaminates such as sulfur or

nitrogen are less in natural gas than fuel oil, and therefore PM/PM_{10} and SO_2 emissions are correspondingly less – approximately 85% to 95% less for the proposed combustion turbine. NO_X emissions from the combustion turbine are also higher when using fuel oil instead of natural gas, however for a different reason than with the emissions of PM/PM_{10}, SO_2, and VOC. The combustion turbine can operate under two different firing modes: a standard combustion mode and a lean pre-mix combustion mode. The standard combustion mode requires direct injection of fuel into the turbine combustor where it mixes with air and is ignited. The lean pre-mix mode allows for the fuel and air to be mixed to a more precise and uniform ratio prior to injection into the combustion chamber. The better more controlled pre-mixing results in less NO_X formation. The lean pre-mix combustion technology can only be applied to gaseous fuels and not to liquid fuel. This results in NO_X emissions that are approximately 50% higher during standard firing of fuel oil over lean pre-mix firing of natural gas.

CO emissions are a direct result of the combustion efficiency of the emission source. Since the combustion efficiencies are relatively similar for natural gas and fuel oil firing, the CO emissions are also relatively similar. VOC emissions are associated with incomplete combustion of the fuel. There are heavier hydrocarbon molecules in fuel oil than in natural gas. The heavier hydrocarbon molecules are more difficult to combust and therefore more organic compounds pass through a combustion source when firing fuel oil than when firing natural gas. For the combustion turbine, the difference in VOC emissions between natural gas and fuel oil is about 90%. It should also be noted that, because CO and VOC emissions are associated with incomplete combustion, the emission rates for CO and VOC are higher during start-up and shutdown of the turbine where the turbine does not perform within its optimum designed operating range.

The emissions of air toxics from both fuels are relatively small. None of the air toxics emitted while firing natural gas or fuel oil are done so in quantities that would be harmful to human health or the environment. Potential emissions of regulated pollutants from the proposed facility were calculated using standard USEPA and MPCA protocol to determine maximum hourly and average annual contaminant concentrations around the facility for a variety of meteorological conditions and operating conditions. Potential emissions for a total of five criteria pollutants and 35 air toxics were determined. The calculated emission rates and potential contaminant concentrations were used to determine maximum hourly and average annual exposure levels for all locations around the facility. These results demonstrated that the acute and chronic toxicity effects and lifetime excess cancer risks of the proposed facility were negligible.

Maximum Permitted Use of Fuel Oil

The PSD Air Quality Permit submitted by Faribault Energy Park, LLC to MPCA requests a federally enforceable limit on SO_2 emissions of 132 tons per year. Although emissions for criteria pollutants are higher when firing natural gas, it is the difference in SO_2 that is the most significant for the PSD permit. As such, the SO_2 permit limit will have the most direct impact on permitted fuel oil usage at the facility. The lowest sulfur content fuel oil commercially available is low sulfur No.2 fuel oil with a maximum regulated sulfur content of 0.05% by

weight. Using the commercially available 0.05% low sulfur fuel oil, the combustion turbine would be restricted to 32.4 million gallons of fuel oil per year or equivalently 2500 hours a year operating at 100% capacity. It should be noted that US EPA regulations are mandating that fuel oil with 0.0015% sulfur be commercially available in 2006. FEP has requested the permit flexibility to use the lower sulfur fuel oil when it becomes commercially available.

Emission Controls

The PSD permit application and review process requires an analysis and selection of Best Available Control Technology as defined by the Clean Air Act. This review was done for all emission sources proposed at the Faribault Energy Park. In addition to the controls describe below, control of all pollutants will be further achieved through the use of good combustion practices and clean fuels.

The Faribault Energy Park will utilize emission controls on the combustion turbine and the auxiliary boiler. As previously mentioned for the combustion turbine, a lean pre-mix low NO_X combustor technology will be employed on the combustion turbine when firing natural gas. When firing fuel oil, the combustion process will be supplemented with water injection to control NO_X emissions. NO_X is formed more rapidly at higher combustion temperatures. The injection of water reduces the flame temperature in the combustor thereby reducing the formation of NO_X. Water injection cannot be used in conjunction with the natural gas lean pre-mix, however. In addition to minimizing NO_X formation during combustion, selective catalytic reduction (SCR) will also be used to reduce NO_X emissions from the turbine exhaust. The SCR will be installed within the heat recovery system on the combined cycle unit. Ammonia is injected to the exhaust upstream of a catalyst bed. The catalyst initiates a reaction between the ammonia and NO_X to form nitrogen and water. The SCR will remove approximately 90% of NO_X in the combustion turbine exhaust stream. Also, since the combustion turbine does not operate as efficiently during start-up and shutdown, measures will be taken to minimize operations in this mode. Specifically, Faribault Energy Park has stated in its PSD permit application that it will not operate the combustion turbine at less than 60% load for more than 485 hours per year while combusting fuel oil or more than 1255 hours per year while combusting natural gas.

The auxiliary boiler utilizes a different combustion technology than the combustion turbine. Therefore, the application of emission control technologies is somewhat different. The auxiliary boiler will utilize a low NO_X burner design in conjunction with flue gas recirculation. These control technologies will be applied when using either fuel oil or natural gas although formation of NO_X is approximately 45% greater when firing fuel oil than when firing natural gas. Both technologies reduce NO_X formation by limiting the amount of oxygen available to combine with the nitrogen and form NO_X. Low NO_X burners also premix the fuel and air to obtain uniform distribution of the fuel mixture prior to injection to the combustion zone. Combined, the low NO_X burner design and flue gas recirculation will reduce NO_X emissions by approximately 60%.

Total Potential to Emit

As specified in the PSD Air Quality Permit Application, the total potential emissions of the facility while operating on fuel oil are shown in Table 1. Emissions for the combustion turbine are shown separately when operating at full load and during start-up and shut down with a sub-total provided for both modes of combustion turbine operation.

Table 1
Potential Emissions from Fuel Oil Combustion

Emission Source	Operating Hours (hr/yr)	NO_X (ton/yr)	CO (ton/yr)	PM/PM_{10} (ton/yr)	VOC (ton/yr)	SO_2 (ton/yr)
Combustion Turbine						
Full Capacity	2015	32.25	32.72	145.19	13.09	93.09
Start-up/Shutdown	485	12.57	288.93	238.73	296.03	11.20
Combustion Turbine Subtotal	2500	44.82	321.65	383.92	309.12	104.29
Auxiliary Boiler	2500	2.88	1.80	1.19	0.12	2.54
Emergency Generator	500	4.02	0.92	0.07	0.12	0.07
Fire Pump Engine	500	2.22	0.48	0.16	0.18	0.15
Facility Total		**53.94**	**324.85**	**385.35**	**309.63**	**107.05**

We hope that this information meets your needs. Please contact me at (612) 349-6868 with any other questions that you might have.

Sincerely,

Faribault Energy Park, LLC

Tim Hunstad